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-1-

STORAGE CASE FOR PORTABLE MEDICATION DELIVERY DEVICE**BACKGROUND OF THE INVENTION**

The present invention pertains to portable medication delivery devices, and, in particular, to cases suitable for storing such devices when not being used.

Patients suffering from a variety of diseases often are able to treat themselves by self-administering appropriate doses of medication. An assortment of differently configured portable medication delivery devices are known. One popular class of portable medication delivery devices include portable injectors, broadly known as injection pens, that have been developed to make it convenient for users to inject medicine, typically through a replaceable needle mounted to the end of the pen. Such injection pens are available in a variety of shapes and sizes and with different working components. The working components of some of these pens utilize electronics to, for example, assist with the selection of the dose, or the administration of a selected dose, from a multi-dose cartridge of medicine provided within such an injection pen.

Reusable injection pens are often provided with a storage case in which the pen can be protectively stored when not in use. Typically, the injection pen can be placed within a complementarily shaped hollow provided in an interior surface of a clamshell-type case. The interior surface of the case, which may be formed of one or more inserts attached to a more rigid shell piece or pieces that form the exterior of the case, also may provide separate hollows adapted to accommodate pen accessories, for example, replacement needles for the pen.

In some situations, the medicine to be delivered by use of the pen should be refrigerated between pen uses. Thus, the injection pen stored in its case stays in the refrigerator when not being used, and is pulled out of the refrigerator for a short time, such as 30 minutes, for use, and after use is then placed back in the refrigerator for storage until its next use. Moving the injection pen in and out of the refrigerator, due to the changing environments, can cause condensation to form on the pen. This condensation can adversely impact the operation of the pen electronics, which may inconvenience the user and result in complaints to the manufacturer.

Thus, it would be desirable to provide a storage case for a portable medication delivery device that addresses at least one of the shortcomings of the prior art.

-2-

**BRIEF SUMMARY OF THE INVENTION**

In one form thereof, the present invention provides a case for storing a portable medication delivery device, including a first part having an exterior surface and an interior surface, a second part having an exterior surface and an interior surface, the first and second parts being movable relative to each other between a case opening arrangement and a case closing arrangement, wherein when in the case closing arrangement the interior surface of the first part and the interior surface of the second part are in a facing relationship that defines an internal volume therebetween, means on at least one of the interior surfaces for storing the portable medication delivery device within the internal volume, and a desiccant held by the first part and in air flow communication with the internal volume for limiting moisture buildup on the portable medication delivery device.

One advantage of the present invention is that a storage case for a portable medication delivery device is provided which reduces the likelihood of condensation forming on the device when not in use, which condensation could adversely impact the reliability of the device.

Another advantage of the present invention is that a storage case for a portable medication delivery device is provided which protects its contents from damage, such as by keeping items from being spilled directly onto a delivery device enclosed within the case.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The above-mentioned and other advantages and objects of this invention, and the manner of attaining them, will become more apparent, and the invention itself will be better understood by reference to the following description of an embodiment of the invention taking in conjunction with the accompanying drawings, wherein:

Fig. 1 is a front perspective view of a storage case for a portable medication delivery device of the present invention, which case is in a closed arrangement;

Fig. 2 is a front perspective view of the storage case of Fig. 1 after being manipulated to an opened arrangement, and wherein the portable medication delivery device with which the case is particularly adapted for use is abstractly shown in dashed lines after its removal from the case; and

Fig. 3 is a cross-sectional view, taken along line 3-3 of Fig. 2, further illustrating the lid part of the storage case of Figs. 1 and 2.

-3-

Corresponding reference characters indicate corresponding parts throughout the several views. Although the drawings represent an embodiment of the present invention, the drawings are not necessarily to scale, and certain features may be exaggerated or omitted in some of the drawings in order to better illustrate and explain the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

Referring now to Fig. 1, there is shown an exemplary embodiment of a portable medication delivery device storage case of the present invention. When in the closed arrangement shown in Fig. 1, the case, generally designated 20, protectively houses articles previously received therein. Case 20 is shown having a clamshell-type design, similar to common types of eyeglasses cases, formed by a lid part and a base part, generally designated 21 and 22 respectively, that are hingedly connected together. However, otherwise designed cases that may be opened and closed may naturally be employed within the scope of the invention.

Lid part 21 includes a contoured, aesthetically appealing outer shell 24, and base part 22 includes an outer shell 26, each made of a durable, rigid material such as plastic. Not shown hinges connect lid shell 24 to base shell 26 such that lid part 21 can be pivoted relative to base part 22 from the closed arrangement shown in Fig. 1 to the arrangement shown in Fig. 2 to open the closed case. The hinges may be spring loaded to resist the case parts when closed together from being opened, and to urge the case parts to mate or completely come together unless the case is fully or at least substantially opened. A latching mechanism abstractly shown at 29 cooperates between lid part 21 and base part 22 to prevent inadvertent opening of the case.

The interior surfaces of case parts 21 and 22 are respectively formed by inserts 30 and 32 molded from, for example, a lightweight plastic which is more flexible than the material of shells 24 and 26 that form the case exterior surfaces. Case inserts 30 and 32 are fixedly attached, such as via snap fits, press fits, or another suitable manner, within lid shell 24 and base shell 26, respectively. Lid part 21 and base part 22 are multiple piece assemblies in the preferred embodiment, as this multiple piece construction results from the fact that the use of separate inserts installed within outer shells facilitates molding as well as allows different material properties to be readily provided for the exterior and interior surfaces of the case.

-4-

A central surface region of insert 32 is recessed to define a device accommodating hollow or recess 35. Other hollows indicated at 36 and 37 are sized and shaped to receive pen accessories, such as not shown replacement needles and a replacement cartridge.

5 Hollow 35 is sized and shaped to uniquely accommodate the portable medication delivery device abstractly shown at 40, such that device 40 is retained securely enough to be held and stored in place, even in the event the case is inverted. For example, this could be a "friction-fit". Such an engagement configuration does not require that the depth of hollow 35 accommodate the entire device, but rather that the device at least partially insertably fit within the hollow.

10 In alternate embodiments, rather than a direct frictional engagement with the insert, device 40 may be received and stored by insert 32 using additional fastener elements known in the art, such as straps, clips or hinged levers to hold the device in place, which hinged levers automatically snap over the device when inserted between the levers. Still further, device 40 can be stored within a shallow hollow in which it is not  
15 frictionally retained, but which hollow, in combination with device 40, while still at least partially within the hollow, abutting the underside of insert 30 when the case is closed but inverted, preventing unrestricted movement of the device within the closed case.

Device 40, when not being stored within carrying case 20, is operable to deliver medication into a user in a known fashion. The shown portable medication delivery  
20 device is in the form of a needled injection pen and may be of any type known to those of ordinary skill in the art. In general, and as is conventional, the pen has mechanisms for selecting and then injecting a dose of medicine. More specifically, a dosing mechanism, such as a rotatable knob, allows a user to adjust the amount of medication to be injected by the pen from a prepackaged container of medication contained within that pen. To  
25 inject a dose of medication, the user inserts the needle into the skin and presses the knob as far as it will depress to cause the injecting mechanism to in fact force the selected amount of medication from the cartridge through the pen needle. Case 20 is well suited for portable medication delivery devices that use electronic circuitry, such as circuitry used to accurately indicate the dose of medication being injected into the user, or to record  
30 data about the injection, or to actually drive the injection. However, and while storage case 20 finds particularly beneficial application for storing devices having electronic components potentially adversely impacted by moisture within the device, this storage

-5-

case can be utilized with strictly mechanical pens, especially when other materials stored within the case could be harmed by moisture contact. Moreover, the device description herein is illustrative and not intended to be limiting as the design of the device, other than its ability to be stored in the carrying case and usable to deliver doses of medication preferably stored in that same case, is not material to the present invention, and other types of portable medication delivery devices, including inhalers, may be substituted for the shown device 40 within the scope of the invention.

Storage case 20 includes a moisture absorbing material to reduce the likelihood that the intended contents of the case will be damaged from moisture when housed therein. The material is in the form of a contained desiccant, such as a desiccant pack 50, held in the shown embodiment by the lid part 21 of the case. Although shown being located only in that lid part, in alternate embodiments, the desiccant can be provided in the base part 22, or in both the lid and base parts.

The desiccant is encapsulated within a container made of paper or plastic, which desiccant pack 50, as further shown in Fig. 3, is held within an internal space 52 between facing surfaces of insert 30 and lid shell 24. The desiccant is in air flow communication with the internal volume of the case formed between the facing interior surfaces of inserts 30, 32 when case 20 is closed, in which internal volume device 40 is stored, such that moisture in that internal volume can be drawn off. Although the air flow communication may be a function of the non-airtight assembly of insert 30 to lid shell 24, such air flow is preferably promoted by the inclusion of one or more holes or slots through the insert. As shown in Figs. 2 and 3, a series of rows and columns of openings 54 serve as vent holes through which moisture can be drawn off by the desiccant from the case internal volume in which the pen 40 is stored. A suitable desiccant is available from Multisorb Technologies, Inc. of Buffalo, New York.

While this invention has been shown and described as having preferred designs, the present invention may be modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses or adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains.